SYLLABUS

DATE OF LAST REVIEW : 02/11/2013
CIP CODE: 47.0604
SEMESTER: Departmental Syllabus
COURSE TITLE: Electrical 2
COURSE NUMBER: AUTT0162
CREDIT HOURS: 2
INSTRUCTOR: Departmental Syllabus
OFFICE LOCATION: Departmental Syllabus
OFFICE HOURS: Departmental Syllabus
TELEPHONE: Departmental Syllabus
EMAIL : KCKCC issued email accounts are the official means for electronically communicating with our students.

PREREQUISITE(S): AUTT0101, AUTT0102, AUTT0161, or approval from instructor

REQUIRED TEXT AND MATERIALS:
Please see bookstore for current textbook(s) and other required material.

COURSE DESCRIPTION:
In this course students will: Perform battery diagnosis; perform battery service; perform starting system diagnosis; perform starting system repair; perform charging system diagnosis; perform charging system repair; identify current flow on starting and charging system diagrams through a variety of learning and assessment activities..

METHOD OF INSTRUCTION:
A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.
COURSE OUTLINE:
All students must comply with personal and environmental safety practices associated with clothing; eye protection; hand tools; power equipment; proper ventilation; and the handling, storage, and disposal of chemicals/materials in accordance with local, state, and federal safety and environmental regulations.

I. Performing battery diagnosis
   A. Calculating battery state-of-charge values
      1. Understanding the hydrometer
      2. Determining proper static voltage
   B. Perform battery tests
      1. Capacity test
      2. Sulfation test
   C. Maintaining electronic memory functions.
   D. Battery hold-downs
   E. Inspection
   F. Battery cables and clamp diagnosis
      1. Visual
      3. Voltage drops
   G. Determine need of battery charging
   H. Jumper cables and auxiliary power supplies
   I. Parasitic draws

II. Perform battery service
   A. Establishing battery service routine
   B. Inspecting
   C. Cleaning
   D. Filling
   E. Replacing
      1. Battery
      2. Cables
      3. Connectors
      4. Clamps
      5. Hold downs
   F. Recharging battery
      1. Acid
      2. Glass matt
      3. Starting
      4. Deep cycle
   G. Methods of jumpstarting
   H. Parasitic load identification and repair

III. Starting system diagnosis
   A. Understanding starter current draw tests
   B. Understanding starter circuit voltage drop tests
   C. Inspecting starter relays and solenoids
   D. Starter replacement
   E. Inspection and testing starters
1. Switches
2. Connectors
3. Wires
4. Starter control circuits
F. Differentiating between electrical and engine mechanical problems

IV. Starting system repair
A. Performing starter current draw tests
B. Performing starter circuit voltage drop tests
C. Repairing and replacing starter relays and solenoids
D. Performing starter replacement
E. Repairing starters
   1. Switches
   2. Connectors
   3. Wires
F. Performing amperage tests to repair problems that cause a slow-crank or no-crank condition.

V. Charging system diagnosis
A. Understanding charging system output tests
B. Diagnose charging systems
   1. Undercharge
   2. No-charge
   3. Overcharge
C. Inspection
   1. Drive belts
   2. Pulleys
   3. Tensioners
   4. Belt alignment.
D. Charging circuit voltage drop tests

VI. Charging system repair
A. Repairing undercharge, no-charge, and overcharge conditions
B. Adjust alternator
   1. Belts
   2. Pulleys
   3. Belt alignment
C. Removal, inspection and replacement of generator (alternator)
D. Performing charging circuit voltage drop tests

VII. Starting and charging system diagrams
A. Utilization of wiring diagrams during diagnosis of electrical circuit problems

EXPECTED LEARNER OUTCOMES:
A. The student will be able to explain battery diagnosis
B. The student will be able to perform battery service
C. The student will be able to describe starting system diagnosis
D. The student will be able to perform starting system repair
E. The student will be able to describe charging system diagnosis
F. The student will be able to perform charging system repair
G. The student will be able to explain starting and charging system diagrams

**COURSE COMPETENCIES:**

_The student will be able to explain battery diagnosis_

1. Perform battery state-of-charge test; determine necessary action.
2. Perform battery capacity test; confirm proper battery capacity for vehicle application; determine necessary action.
3. Maintain or restore electronic memory functions.
4. Inspect, clean, fill, and/or replace battery, battery cables, connectors, clamps, and hold-downs
5. Perform battery charge
6. Start a vehicle using jumper cables or an auxiliary power supply
7. Measure and diagnose the cause(s) of excessive parasitic draw; determine necessary action

_The student will be able to perform battery service_

8. Perform battery state-of-charge test; determine necessary action
9. Perform battery capacity test; confirm proper battery capacity for vehicle application; determine necessary action
10. Maintain or restore electronic memory functions
11. Inspect, clean, fill, and/or replace battery, battery cables, connectors, clamps, and hold-downs
12. Perform battery charge
13. Start a vehicle using jumper cables or an auxiliary power supply
14. Measure and diagnose the cause(s) of excessive parasitic draw; determine necessary action

_The student will be able to describe starting system diagnosis_

15. Perform starter current draw tests; determine necessary action
16. Perform starter circuit voltage drop tests; determine necessary action
17. Inspect and test starter relays and solenoids; determine necessary action
18. Remove and install starter in a vehicle
19. Inspect and test switches, connectors, and wires of starter control circuits; perform necessary action
20. Differentiate between electrical and engine mechanical problems that cause a slow-crank or no-crank condition

_The student will be able to perform starting system repair_

21. Perform starter current draw tests; determine necessary action
22. Perform starter circuit voltage drop tests; determine necessary action
23. Inspect and test starter relays and solenoids; determine necessary action
24. Remove and install starter in a vehicle
25. Inspect and test switches, connectors, and wires of starter control circuits; perform necessary action
26. Differentiate between electrical and engine mechanical problems that cause a slow-crank or no-crank condition

_The student will be able to describe charging system diagnosis_

27. Perform charging system output test; determine necessary action
28. Diagnose charging system for the cause of undercharge, no-charge, and overcharge conditions
29. Inspect, adjust, or replace generator (alternator) drive belts, pulleys, and tensioners; check pulley and belt alignment
30. Remove, inspect, and install generator (alternator)
31. Perform charging circuit voltage drop tests; determine necessary action
   The student will be able to perform charging system repair
32. Perform charging system output test; determine necessary action
33. Diagnose charging system for the cause of undercharge, no-charge, and overcharge conditions
34. Inspect, adjust, or replace generator (alternator) drive belts, pulleys, and tensioners; check pulley and belt alignment
35. Remove, inspect, and install generator (alternator)
36. Perform charging circuit voltage drop tests; determine necessary action
   The student will be able to explain current flow on starting and charging system diagrams
37. Use wiring diagrams during diagnosis of electrical circuit problems

ASSESSMENT OF LEARNER OUTCOMES:
Assessment methods may include, but are not limited to, the following: Homework, Assignments, Quizzes, Class Participation, Chapter Tests, and Final Exam. The grading scale and the process for calculating the course grades are to be determined by the individual instructors. This information will be included in each instructor’s syllabus.

SPECIAL NOTES:
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college’s policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the Director of the Academic Resource Center in Room 3354 or call (913) 288-7670 V/TDD.